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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,970	12/09/2003	Yan-Fei Liu	14546	2225

293 7590 01/21/2005

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EXAMINER
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BERHANE, ADOLF D

ART UNIT	PAPER NUMBER
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2838

DATE MAILED: 01/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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**Office Action Summary****Application No.**

10/729,970

**Applicant(s)**

LIU ET AL.

**Examiner**

Adolf Berhane

**Art Unit**

2838

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 and 36-47 is/are rejected.
- 7) ☒ Claim(s) 34 and 35 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/30/04</u> . | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 9/30/04 has been considered by the examiner.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 3-6, and 9-11 are rejected under 35 U.S.C. 102(a) as being anticipated by Wei et al. (6,757,184).

Wei et al. disclose a step-down buck converter with full bridge circuit in Figs. 2 and 8. An input for accepting the DC voltage ( $V_{in}$ ), the input having a first voltage input and a second voltage input, an output for outputting a converted DC voltage ( $V_{out}$ ), the output having a first voltage output and a second voltage output, a high side circuit (20, 22) including a first primary winding ( $W1$ ) of a first transformer ( $M$ ) and an auxiliary section ( $Q1, Q2, Q3, Q4$ ), the high side circuit connected between the first voltage input and the first voltage output, a rectifier circuit (28, 30) having a first secondary winding ( $W2$ ) of the first transformer ( $M$ ), the rectifier circuit connected between the first voltage output and the second voltage output, and an output capacitor ( $C3$ ) connected between the first voltage output and the second voltage output and across the rectifier circuit (28, 30).

4. Claims 1-33, 46 and 47 are rejected under 35 U.S.C. 102(a) as being anticipated by Xu et al. (2004/0246748).

Xu et al. disclose a bridge buck converter with self-driven synchronous rectifiers in Figs. 2, 4, 8 and 9. An input for accepting the DC voltage ( $V_{in}$ ), the input having a first voltage input and a second voltage input, an output for outputting a converted DC voltage ( $V_{out}$ ), the output having a first voltage output and a second voltage output, a high side circuit (20, 22) including a first primary winding ( $W1$ ) of a first transformer ( $M$ ) and an auxiliary section ( $Q1, Q2, Q3, Q4$ ), the high side circuit connected between the first voltage input and the first voltage output, a rectifier circuit (28, 30) having a first secondary winding ( $W2$ ) of the first transformer ( $M$ ), the rectifier circuit connected between the first voltage output and the second voltage output, and an output capacitor ( $C3$ ) connected between the first voltage output and the second voltage output and across the rectifier circuit (28, 30). Fig. 9 discloses rectifier circuit with first and second secondary windings ( $W2, W4$ ).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 36-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wei et al.

Wei et al. discloses the claimed invention except for the range of values. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the optimum range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

7. Claims 36-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xu et al. (2004/0246748).

Xu et al. discloses the claimed invention except for the range of values. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the optimum range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

***Allowable Subject Matter***

8. Claims 34 and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


9. The following is a statement of reasons for the indication of allowable subject matter: None of the cited prior art disclose or teach a DC-DC converter with a three transformers and a switch connected to each primary winding and a fourth switch connected between the first primary winding and second voltage input, a fifth switch connected between the first voltage input and the second side of the second primary winding, sixth switch connected between the second side of the second primary winding

and the second voltage input, a seventh switch connected between second side of the third primary winding and the first voltage input and an eight switch connected between the second side of the third primary winding and the second voltage input.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adolf Berhane whose telephone number is 571-272-2077. The examiner can normally be reached on Monday- Friday 8 AM to 6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on 571-272-2084. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Adolf Berhane  
Primary Examiner  
Art Unit 2838